charge transport direction between the first shorting bar and the second shorting bar through the magnetic field region.

3. The thermoelectric structure of claim **1**, wherein the magnetic field is produced by a thin layer of magnetic material deposited at least atop or beneath the plane of the thin thermoelectric film, adjacent to the magnetic field region.

4. The thermoelectric structure of claim **1**, wherein the adjacent curved ballistic scattering guides are separated by a distance of between 1 nm and 1 μm along an axis parallel to the first and second shorting bars.

5. The thermoelectric structure of claim **1**, further comprising:

a first plurality of collimating scattering guides formed normal to the first and second shorting bars in a first collimating region subjected to negligible magnetic fields between the first shorting bar and the magnetic field region;

a second plurality of collimating scattering guides formed normal to the first and second shorting bars in a second collimating region subjected to negligible magnetic fields between the second shorting bar and the magnetic field region.

6. The thermoelectric structure of claim **5**, wherein the curved ballistic scattering guides and the collimating scattering guides are formed by laser or mechanical scribing.

7. The thermoelectric structure of claim **5**, wherein the curved ballistic scattering guides and the collimating scattering guides are formed by surface level or field doping.

8. The thermoelectric structure of claim **5**, wherein the curved ballistic scattering guides and the collimating scattering guides are formed by lithographic patterning.

9. The thermoelectric structure of claim **5**, wherein adjacent collimating ballistic scattering guides are separated by a distance between 1 nm and 1μ along an axis parallel to the first and second shorting bars.

10. The thermoelectric structure of claim **1**, wherein the thin thermoelectric film has a thickness less than the electron mean free path in the thin thermoelectric film.

11. The thermoelectric structure of claim **1**, wherein the curved ballistic scattering guides extend through the entire thickness of the thin thermoelectric film.

12. The thermoelectric structure of claim **1**, wherein the thin thermoelectric film is formed of a semi-metal.

13. The thermoelectric structure of claim **1**, wherein the thin thermoelectric film is formed of a high-mobility semiconductor.

14. The thermoelectric structure of claim **13**, wherein the thin thermoelectric film is formed of a graphene.

15. The thermoelectric structure of claim **1**, wherein the first and second shorting bars are formed of a conducting layer of doped material.

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